

AMENDMENTS TO THE SPECIFICATION

Please amend the following paragraphs:

[0004] The present invention relates to a mobile communication station (mobile station), and more particularly, to a mobile station and a display therein, in which a plurality of LCDs (Liquid Crystal Displays) are made operative from one operation means for recognizing information on an originating station and information on a state of a receiver station even if a ~~folder~~ folding cover is not opened in a ~~folder~~ folding type mobile station.

[0009] Referring to FIG. 2, the device for displaying characters, numerals, or figures on two faces of the device is provided with a first and a second liquid crystal displays 26a and 26b respectively having signal ~~electrodes~~ lines and scan ~~electrodes~~ lines, a controller 21 for receiving and ~~analysing~~ analyzing a video signal, to provide a control signal for displaying characters, numerals, and figures, a first memory 22, a volatile memory for temporary storage of a signal or storage of booted data for accelerating operation of the controller 21, a second memory 23, a non-volatile memory for storing a general management algorithm of the controller 21 therein, a first operator 24a for operating the signal ~~electrodes~~ lines and the scan ~~electrodes~~ lines in the first LCD 26a in response to a control signal from the controller 21 for displaying the video signal, a second operator 24b for operating the signal ~~electrodes~~ lines and the scan ~~electrodes~~ lines in the second LCD 26b in response to a control signal from the controller 21, and first and second frame memories 25a and 25b for storing signals to be used in implementing the characters, numerals, and figures provided from the controller 21 for the first and second operators 24a and 24b. That is, there are two LCDs each having separate signal ~~electrodes~~ lines and scan ~~electrodes~~ lines and two operators for operating respective LCDs.

[0011] Upon reception of system power, the controller 21 accesses to an operation program in the second memory 23, to be in a state that an initially booted condition of the system is maintained, and detects an external signal input for displaying characters, numerals, or figures. Upon detection of reception of an external signal, the controller analyses the input signal according to the managing algorithm and ~~analysing~~ analyzing algorithm stored in the first and second memories 22 and 23, and provides a control signal for displaying characters, numerals, and figures to the first and second operators 24a and 24b. Each of the first and second operators

24a and 24b provides an operating signal for displaying the characters, numerals, and figures to the scan ~~electrodes~~ lines and the signal ~~electrodes~~ lines in the first and second LCDs 26a and 26b attached on the inside and outside of a system for two faced display in response to the control signal for display from the controller 21. The first and second frame memories 25a and 25b process and store the control signals for displaying characters, numerals or figures provided for controlling display from the controller 21 in frame units, and present the signals in frame units stored in relevant memory regions in response to an access signal from the first and second operators 24a and 24b, thereby maintaining a stable display of the characters, numerals, or figures on the first and second LCDs 26a and 26b.

[0014] Second, the two operators required for operating the two LCDs respectively occupy much space inside of the system, that impedes fabrication of a light weight and slim product. For example, the two LCDs required to attach to an inside and outside of the ~~folder~~ folding cover for recognition of information on an originating station, recognition of received characters, and reading time information, without opening the ~~folder~~ folding cover in a folder type mobile station, is not in line with a goal of providing a small sized and light folder type mobile station device, and increases cost due to the addition of an expensive LCD and operator.

[0017] An object is to provide a mobile station and a display therein, which has a low power consumption, permits effective use of limited space and to save a production cost, permits to recognize information on an originating station, a received message, time information, and other message displayed without opening the ~~folder~~ folding cover, and to permit to provide a light weight, and slim mobile station.

[0019] To achieve these and other advantages and in accordance with the purposes of the present invention, as embodied and broadly described, the mobile station includes a ~~folder~~ folding cover movable between an opened position and a closed position, first display means mounted on one side of the ~~folder~~ folding cover having 'n' first signal ~~electrodes~~ lines and 'k' scan ~~electrodes~~ lines, second display means mounted on the other side of the ~~folder~~ folding cover having 'n' second signal ~~electrodes~~ lines and 'm-k' scan ~~electrodes~~ lines, and an operator for operating the first and second display means having 'm' scan electrode lines connecting the 'k' scan ~~electrodes~~ lines in the first display means and the 'm-k' scan ~~electrodes~~ lines in the second display means,

and 'n' signal electrode lines connecting the first signal ~~electrodes~~ lines and the second signal ~~electrodes~~ lines, respectively.

[0020] In other aspect, there is provided a mobile station including a ~~folder~~ folding cover movable between an opened position and a closed position, first display means mounted on one side of the ~~folder~~ folding cover having 'n' first scan ~~electrodes~~ lines and 'k' signal ~~electrodes~~ lines, second display means mounted on the other side of the ~~folder~~ folding cover having 'n' second scan ~~electrodes~~ lines and 'm-k' signal ~~electrodes~~ lines, and an operator for operating the first and second display means having 'm' signal electrode lines connecting the 'k' signal ~~electrodes~~ lines in the first display means and the 'm-k' signal ~~electrodes~~ lines in the second display means, and 'n' scan electrode lines connecting the first scan ~~electrodes~~ lines and the second scan ~~electrodes~~ lines, respectively.

[0021] In another aspect, there is provided a display in a mobile station including first liquid crystal display having a plurality of first signal ~~electrodes~~ lines defining a plurality of first pixels and a plurality of first scan ~~electrodes~~ lines, second liquid crystal display having a plurality of second signal ~~electrodes~~ lines defining a plurality of second pixels and a plurality of second scan ~~electrodes~~ lines, and an operator for operating the first and second liquid crystal displays having a plurality of scan electrode lines connecting the first and second scan ~~electrodes~~ lines, and a plurality of signal electrode lines connecting the first signal ~~electrodes~~ lines and the second signal ~~electrodes~~ lines, respectively.

[0022] In further aspect, there is provided a display in a mobile station including first liquid crystal display having a plurality of first signal ~~electrodes~~ lines defining a plurality of first pixels and a plurality of first scan ~~electrodes~~ lines, second liquid crystal display having a plurality of second signal ~~electrodes~~ lines defining a plurality of second pixels and a plurality of second scan ~~electrodes~~ lines, and an operator for operating the first and second liquid crystal displays having a plurality of signal electrode lines connecting the first and second signal ~~electrodes~~ lines, and a plurality of scan electrode lines connecting the first scan ~~electrodes~~ lines and the second scan ~~electrodes~~ lines, respectively.

[0038] Referring to FIG. 3, the display in a mobile station in accordance with a preferred embodiment of the present invention includes an operator 100, a first LCD 200, and a second

LCD 300 with common signal electrode lines, so that the one operator 100 operates the first and second LCDs. That is, the operator 100 controls operation of 'n' signal electrode lines $SEG_1 - SEG_n$, and 'm' scan electrode lines $COM_1 - COM_m$, for displaying characters, numerals, and figures on the first or second LCDs 200 or 300 in response to a control signal provided from a system controller. The first LCD 200 includes 'n' signal ~~electrodes~~ lines connected to 'n' signal electrode lines $SEG_1 - SEG_n$ in the operator 100 respectively, and 'k' scan ~~electrodes~~ lines connected to from a first to 'k'th scan electrode lines $COM_1 - COM_k$ among the 'm' scan electrode lines $COM_1 - COM_m$, respectively. Accordingly, the first LCD 200 has $n \times k$ pixels. The second LCD 300 includes 'n' signal ~~electrodes~~ lines connected to 'n' signal electrode lines $SEG_1 - SEG_n$ in the operator 100 respectively, and 'm - k' scan ~~electrodes~~ lines connected to from a (k + 1)th to 'm'th scan electrode lines $COM_{k+1} - COM_m$ among the 'm' scan electrode lines $COM_1 - COM_m$, respectively. Accordingly, the second LCD 300 has $n \times (m-k)$ pixels. The 'n' signal electrode lines have 'n' first signal electrode lines connecting the operator 100 to the 'n' signal ~~electrodes~~ lines in the first LCD 200, and 'n' second signal electrode lines connecting the 'n' signal ~~electrodes~~ lines in the first LCD 200 to the 'n' signal ~~electrodes~~ lines in the second LCD 300.

[0039] Though not shown, the system may be provided such that the operator 100 operates the first and second LCDs 200 and 300 with the scan electrode lines provided in common. That is, the operator 100 controls operation of the 'n' scan electrode lines $COM_1 - COM_n$, and 'm' signal electrode lines $SEG_1 - SEG_m$, for displaying characters, numerals, or figures on the first or second LCD 200 or 300 in response to the control signal provided from the system controller. The first LCD 200 has 'n' scan ~~electrodes~~ lines connected to 'n' scan electrode lines $COM_1 - COM_n$ in the operator 100 respectively, and 'k' signal ~~electrodes~~ lines connected to a first to a 'k'th signal electrode lines $SEG_1 - SEG_k$ among the 'm' signal electrode lines $SEG_1 - SEG_m$, respectively. Therefore, the first LCD 200 has $n \times k$ pixels. The second LCD 300 has 'n' scan ~~electrodes~~ lines connected to 'n' scan electrode lines $COM_1 - COM_n$ in the operator 100 respectively, and 'm - k' signal ~~electrodes~~ lines connected to a 'k+1'th to a 'm'th signal electrode lines $SEG_{k+1} - SEG_m$ among the 'm' signal electrode lines $SEG_1 - SEG_n$, respectively. Therefore, the second LCD 300 has $n \times (m-k)$ pixels. The 'n' scan electrode lines have 'n' first scan electrode lines connecting the operator 100 to the 'n' scan ~~electrodes~~ lines in the first LCD

200, and the 'n' second scan electrode lines connecting the 'n' scan ~~electrodes~~ lines in the first LCD 200 to the 'n' scan ~~electrodes~~ lines in the second LCD 300.

[0044] The display in a mobile station in accordance with a second preferred embodiment has an operator 100 built in a ~~folder~~ folding cover. That is, first and second LCDs 200 and 300, a light plate 'A', and a light shielding film 'B' are disposed the same as shown in FIG. 4, only the operator 100 is built in a ~~folder~~ folding cover body through a FPC (Flexible wire). When the display having the first and second LCDs is mounted on a folder of a mobile station, the first LCD 200, the main screen, is fixed to an inside surface of the folder, and a window is formed in a portion of the folder corresponding to a portion of the second LCD 300, so that the second LCD 300 displays to the outside of the folder, as shown in FIGS. 7 and 8.

[0046] Referring to FIG. 7, a mobile station includes a body 400, a ~~folder~~ folding cover 410, and a hinge 430 for coupling the body 400 and the ~~folder~~ folding cover 410. And, the body 400 has a ~~folder~~ switch 420 for sensing opening and closing of the ~~folder~~ folding cover 410, and the ~~folder~~ folding cover 410 has the first LCD 200 on an inside thereof, and the second LCD 300 on an outside thereof.

[0048] Referring to FIG. 6, a display in a mobile station for operating two LCDs by one operator includes a controller 70, a RAM 80, a ROM 90, an operator 100, and a frame memory 110. The controller 70 controls overall display operation of the first and second LCDs 200 and 300, and, particularly, as can be known from FIG. 7, the controller 70 activates the first LCD 200 mounted on an inside surface of the ~~folder~~ folding cover 410 according to a signal of the ~~folder~~ switch 420 switched as the ~~folder~~ folding cover 410 is opened/closed, or as can be seen from FIG. 8, activates the second LCD 300 mounted on an outside of the ~~folder~~ folding cover 410 which provides brief information, such as information on an originating station, name, information on the present time, and the like on reception of a signal. The RAM 80 stores a signal provided to a volatile memory temporarily, or a booted data, for accelerating operation of the controller, and the ROM 90 is a nonvolatile memory for storing a general management algorithm for the controller 70 therein. The operator 100 controls operation of a plurality of signal ~~electrodes~~ lines SEG₁ - SEG_n, and a plurality of scan ~~electrodes~~ lines COM₁ - COM_m for selective operation of the first and second LCDs 200 and 300 respectively mounted on inside/outside surfaces of the

~~folder~~ folding cover 410 in response to a control signal provided from the controller 70 for displaying characters, numerals, or graphics of figures. The frame memory 110 processes a signal provided for controlling display in frame units for maintaining a stable display of the characters, numerals, or figures.

[0050] First, a case when the display of the mobile station has a system as shown in FIG. 3 will be explained. When power is supplied to a folder type mobile station, the controller 70 is initialized according to the algorithm and the management program stored in the RAM 80 and in the ROM 90, and upon completion of an initialization booting, the step proceeds to a standby mode for analyzing a signal from the ~~folder~~ switch 420 switched according to opening and closing of the ~~folder~~ folding cover 410 centered on the hinge 430. If the signal from the ~~folder~~ switch 420 is analyzed in the above step indicates that the ~~folder~~ folding cover 410 is closed, the controller 70 determines that the mobile station is in a mode for displaying the present time, and information on a status of the mobile station through the second LCD 300, a supplementary screen, provided on an outside of the ~~folder~~ folding cover 410, and provides a control signal pertinent to the mode to the operator 100. Then, the operator 100 displays the information on a state of the mobile station, and information on the present time on the second LCD 300 mounted on an outside of the ~~folder~~ folding cover 410 in response to the control signal. That is, a frame signal for implementing display stored in the frame memory 110 is read, and only first to 'n'th signal ~~electrodes~~ lines SEG₁ - SEG_n and 'k+1'th to 'm'th scan ~~electrodes~~ lines COM₁ - COM_m are controlled, for displaying the information on the second LCD 300.

[0051] In a state that general information on the mobile station is displayed on the second LCD 300, a supplementary screen, formed on outside of the ~~folder~~ folding cover 410, if the signal from the ~~folder~~ switch 420 indicates that the ~~folder~~ folding cover 410 is opened, then the controller 70 provides a control signal to the operator 100 for executing change over of the display of the state information from the second LCD 300 to the first LCD 200. Accordingly, the operator cuts off the display on the second LCD 300, and displays the general information through the first LCD 200. That is, a frame information on implementation of display stored in the frame memory 110 is read, and only first to 'n'th signal ~~electrodes~~ lines SEG₁ - SEG_n and first to 'k'th scan ~~electrodes~~ lines COM₁ - COM_k are operated, for displaying the information on the first LCD 200. And, under a state in which the ~~folder~~ folding cover is closed only to display

general status information through the second LCD 300, if a call is detected through a base station relay, the controller 70 analyses information on the originating station included in the call, and displays an originating call number on the second LCD 300. Accordingly, the subscriber can select connection to the call depending on the information on the displayed originating station, and a received message in characters or a call message can be recognized, conveniently.

[0056] Fourth, since general operation status, such as recognition of information on an originating station for the call, reception of a message in characters, and time information, is displayed on the LCD mounted on an outside of the folder, the number of openings and closings of the ~~folder~~ folding cover, unnecessary power consumption caused by opening and closing of the ~~folder~~ folding cover can be reduced, such as back light illumination, can be eliminated, that can prolong an lifetime of the battery.